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Special Article

Validity of Classification of Externalizing Disorders

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ABSTRACT

There is increasing recognition that the externalizing disorders continue into adulthood or cause substantial impairment that may persist into adulthood. These disorders place substantial demands on the health care, education and legal resources and have considerable public health importance. The concept and the nosology of the externalizing disorders have evolved considerably over the last few decades. Efforts were made to keep DSM-IV (Diagnostic and Statistical Manual) and ICD-10 (International Classification of Diseases) close to each other to enhance international consensus and subsequently the validity of these disorders. This article aims to review the conceptual basis and the debate over the nosology of externalizing disorders with a view to examine the validity of ICD-10 diagnoses.

INTRODUCTION

There are certain disorders in childhood and adolescence that predominantly manifest through behaviour, activity and conduct and are called externalizing disorders. Kovacs & Devlin described dysregulated behavior as the central feature of such disorders.[1] These disorders appear under the rubric of Attention Deficit and Disruptive Behavior Disorders in DSM-IV-TR[2] and include attention deficit hyperactivity disorder (ADHD), conduct disorder (CD) and oppositional defiant disorder (ODD). ICD-10 describes two categories viz. hyperkinetic disorder (HD) and conduct disorder. Oppositional disorder appears as a subtype of CD in ICD-10.[3] The disorders are grouped together to emphasize their shared features and areas of impairments.

Externalizing disorders are the most common disorders of the childhood and are associated with male sex and a high degree of co morbidity.[4] Impulsivity, poor executive control and callous unemotional traits lead to impairments in scholastic skills and general development. There is increasing recognition that these disorders continue into adulthood or cause substantial impairment that may persist into adulthood. These disorders place substantial demands on the health care, education and legal resources in the community and have considerable public health importance.

The concept and the nosology of externalizing disorders have evolved considerably over the past few decades. There have been major changes in the diagnostic criteria in different versions of the DSM. An attempt has also been made to keep DSM-IV and ICD-10 close to each other so as to enhance international consensus and subsequently the validity of these disorders. Nevertheless, an examination of the validity of ICD-10 externalizing disorders raises some important questions:

1. Whether dimensions are preferable to categorical classification for these disorders? If so, how the dimensions should be defined and operationalized in the present classificatory system to make it user friendly?
2. What are the key components in the definition of the disorders?
3. Whether the disorders defined by the present descriptors are internally valid, i.e.
   i. whether the descriptor set are consistent with the results of multivariate analyses?
   ii. whether the descriptors are consistently found in the target groups of children recognized by researchers and clinicians?
4. Whether the descriptors are externally valid, i.e.
   i. Whether the descriptors are consistently associated with genetic, neuropsychological and biological parameters (construct validity)
   ii. whether the disorders have a predictable course and outcome and treatment response (predictive validity)
5. Whether the disorders have a clear boundary from normal children as well as other disorders?

This article aims to review the conceptual basis and the debate over the nosology of externalizing disorders with a view to examine the validity of ICD-10 criteria. We hope to draw useful inferences and offer suggestions that may be useful for the next version of the ICD.

Hyperactivity – ADHD – HD

Increased level of activity, inattention and impulsiveness are common behaviour problems during preschool and school age years. Adolescents and adults, to a lesser extent, also manifest these behavioral traits. In the severe form, these behaviour traits could be significantly dysfunctional for the affected individuals and disturbing to those around them and so are considered the symptoms of mental disorder. Children with hyperactivity disorder display developmentally inappropriate hyperactivity, inattention, impulsive behaviour and consequent academic underachievement.

Current nosology

DSM-IV-TR requires the presence of six symptoms out of any of the two criteria sets related to inattention and hyperactivity-impulsivity. The specified age of onset is prior to seven years and minimum duration required is six months. The symptoms may be present in alternate situation of school or family. Three subtypes are possible: predominantly hyperactive- impulsive, predominantly inattentive, and the combined type.[2]

ICD-10 requires variable number of symptoms from all three descriptor sets, six from inattention, three from hyperactivity and one from impulsivity. The symptoms are required to be pervasive i.e. present across all situations. The only subtypes described are sub threshold syndromes and the new subtype of hyperkinetic conduct disorder that is believed to be associated with neurological soft signs, developmental delays and learning problems.[3]

In contrast to the previous editions, DSM-IV and ICD-10 have come closer to each other in terms of defining the disorder in terms of the three cardinal features; however, there are important differences too. DSM-IV uses a disjunctive approach between two domains of symptoms, inattention and hyperactivity-impulsivity. ICD-10 uses a conjunctive approach to include all the three domains of the disorder with differential weighting of symptoms from each group. DSM generates subtypes; ICD for all practical purposes describes one syndrome. DSM requires the symptoms to be present in alternate circumstances; ICD 10 requires the symptoms to

be pervasive across all situations. Thus DSM-IV has a broader definition and a lower threshold for diagnosis compared to ICD-10. Thus, ICD-10 is likely to pick up more severe forms of the disorder. DSM allows for co morbid diagnoses (with conduct disorder), ICD does not. Neither classification mentions the influence of age on the symptoms of the illness.

Review of evidence

Let us now try to answer the question raised in the introduction from the currently available research evidence.

Dimensional Vs. Categorical Approach

The merits and demerits of dimensional and categorical classification and interests and concerns generated among the researches are well known. It is also known that present classification describes categories for all disorders of children and adults alike and even for the conditions (like childhood disorders) that could be more accurately described on dimensions. There are certain evidences in support of dimensional classification of ADHD-HD. The constituent behaviour of this disorder varies widely in the general population. ADHD is an extreme form of this continuously distributed behavioural trait and affected individuals may be quantitatively different from the unaffected ones.[5] Symptoms like hyperactivity (64%-77%) and inattention (76%-87%) have been reported to be heritable. This supports the view that if the temperamental traits of "activity" and "persistence" are the dimensions over which hyperactivity and inattention are the extreme variations then those behaviour traits also appear to have strong genetic influence.[6] Finally, the dimensional (quantitative) approach is supported by the observation that no bimodal distribution with clear points of rarity has been observed between those with high and those with low hyperactivity.[5] However, it is still not clear whether dimensional classification is to be preferred over a categorical one for the practical purposes of classification. Individuals defined by dimensions of hyperactivity will have high or low scores and no boundary or threshold of morbidity. This will leave the clinicians in dilemma as to when to intervene in the affected children. It is possible that a combination of both the approaches could be useful for the clinicians as well as the researchers.

Key features

Initial studies supported the notion that hyperactive behavior emerges as a factor distinct from defiance when Connor's scales were applied to school children in United States of America.[7] In 1972, Virginia Douglas and her colleagues suggested deficits in the ability to sustain attention underlay the observed symptoms of hyperactivity and poor impulse control.[8] As already mentioned, ICD-10 as well as DSM-IV-TR capture the three domains of symptoms although somewhat differently. In addition to these core features, ADHD is also attended by pathology in motivation (leading to inconsistency and unpredictability), emotionality (resulting in poor anger control), and in time sense (leaving tasks at hand unfinished).[9]

Internal consistency

The relation among the three domains of core symptoms has been shown by factor analysis using Child Behavior Check List (CBCL) and Connor's scale in the community.[10] Cognitive (inattention) and behaviour (hyperactivity) items emerged as independent dimensions of psychopathology. Confirmatory factor analyses of both parent and teacher data showed a better fit for a four-factor model of inattention, hyperactivity-impulsivity, ODD, and CD.[11] The observations support the validity of DSM-IV but not of ICD-10 diagnoses. Several factor analytic studies mainly from western countries like United States of America, Australia, Brazil,

and Germany have largely supported the two dimensional model of the DSM-IV-TR as appropriate for the diagnosis of ADHD.[12] Among Asian studies, Yang et al[13] from Taiwan supported the two dimensional models; while Kanbayashi et al[14] reported support for a three dimensional model of DSM-III. However, a similar study of the parent teacher report using inattention, hyperactivity/impulsivity and ODD factors failed to show convergent and discriminant validity in Malaysian children.[15] The available evidence suggests the key components tend to generate subtypes in clinical and community population.

The validity of a single subtype of HD-CD of ICD-10 has been a subject of debate. Specific studies addressing HD-CD are not available, but there are reports on ADHD co morbid with CD. About 25% of cases with ADHD have CD and 40% of cases of CD have ADHD. When CD begins before 12 years of age almost all such children meet the criteria of ADHD whereas about one third of children with adolescent onset CD meet ADHD criteria.[16] An increased rate of reading disorder, impaired language skills, visuomotor integration, and visuospatial skills has been reported in the co morbid group.[17] Similar rates of ADHD have been described in the relatives of the two groups but higher rates of CD have been described in the relatives of the co morbid group.[18] Thus the hybrid hypothesis is supported on certain clinical, familial and cognitive measures.

Presence of criterion symptoms in target populations

Large scale community based studies have been conducted using the different versions of the DSM criteria; with some resultant difficulty in interpreting and comparing data. The consensus statement by NIH evaluating multiple centers data reported the prevalence of ADHD to be 1.7% to 16.1% with the average rate of 3%-5%.[19] Recent systematic reviews report prevalence estimates as wide as 2%-18%.[20] There is consistent evidence of higher prevalence in boys as compared to girls. Age related differences are also noted in prevalence with rates decreasing with increasing age. In community settings, males were diagnosed at least three times as often as females[21,22].

In India there is very little systematic research on ADHD in children.[23] Bhatia et al reported prevalence rates ranging from 10% to 20% using ICD criteria; [24,25] while Gada et al reported the prevalence to be 8.7% in primary school children in Bombay using DSM criteria.[26]

There are a few reports on the concordance of diagnosis of ADHD of DSM-IV and HD of ICD-10. Children who met full criteria of HD also met the full criteria of ADHD. However, only 26% of ADHD children met criteria for HD. Both HD and ADHD exhibit predictive validity over six years but ICD-10 HD appeared to under-identify children with persistent ADHD symptoms.[27] In another study HD constituted only the severe 20% of ADHD where the severity was judged by an increased rate of neurodevelopmental delay, poor cognitive function, psychosocial impairment and co morbid psychopathology.[28]

Are the DSM-IV-TR subtypes valid? About 50% to 75% of children with ADHD have the combined subtype. The inattentive subtype is present in about 20%-30% of those with ADHD. Less than 15% of ADHD children meet the criteria for the hyperactive-impulsive subtype.[2] While the combined subtype is the most prevalent subtype in both genders, girls with ADHD are about 2.2 times as likely to primarily have the inattentive subtype. [29,30] The patterns of comorbidity support heterogeneity of the subtypes. The inattentive subtype appears to be associated more often with anxiety, depression, and learning disabilities. The hyperactive-impulsive and combined subtypes are more often associated with oppositional defiant disorders,

conduct disorders, and antisocial personality disorder in adulthood.[29,30,31] On the other hand the subtypes may represent developmental stages rather than distinct entities. The symptoms of ADHD seem to vary depending on the stage of development. The behavioral symptoms are usually prominent in preschool children; in school going children attention problems predominate but behavioural symptoms are common; in adolescents and adults, problem of inattention are more common.[28,32] Thus, some authors feel that data supporting the validity of the subtypes are scarce.[33]

The ADHD Observational Research in Europe (ADORE) project was designed as a prospective, non–interventional study of approximately 1,500 patients observed by approximately 300 investigators in various European regions. Patients had a mean age of 9 years and 84% were male. Physician diagnoses were made using DSM-IV (43%), ICD-10 (32%) and both DSM-IV and ICD-10 (12%). The study showed that ADHD is similarly recognized across 10 European countries.[34] Apart from impressive evidence for the cross-cultural factorial validity, internal consistency as well as convergent and divergent validity of ADHD; the study also found that the ICD-10 3-factor model seems to be less robust than the DSM-IV 2-factor model, but may be a good description for special populations (boys, younger children).[35] The reliability and cross-cultural validity of ADHD has also been supported by other studies, e.g. the studies of Souza et al that used DSM-IV criteria in 343 ADHD children in Brazil;[36] and Lee that used the DSM-IV construct in Korea.[13] Roessner et al assessed cross-cultural similarities and differences in two naturalistic clinical samples of children diagnosed with ADHD combined type according to DSM-IV criteria or with HD according to ICD-10 criteria.[37] They showed that both samples provided evidence that dimensions associated with the diagnosis of ADHD combined type might be comparable in two clinical settings with diverse cultural backgrounds in Brazil and Germany.

Construct validity

There is strong evidence of heredity of DSM-IV-TR ADHD based on reports of family as well as twin studies.[38,39,40] Preliminary evidence is available on the association of specific genes DAT1 and DRD4 with ADHD.[41] No published report in this area is available regarding ICD-10 HD. Moreover, the available genetic basis is in no way specific to the ADHD and overlaps with that of the co morbid conditions.

The neuropsychological literature implicates deficits in response inhibition;[42,43] and various executive functions in the pathogenesis of ADHD.[44] Although increasingly recognized as the central feature in the disorder, deficient inhibition of response has also been described in conduct disorder and language disorders.[45] Whether this dysfunction is the marker for behavioral trait like impulsivity or aggression or for the disorder per se is not clear at present.

A right sided defect in the prefrontal-thalamic-striatal-cerebellar connections has been proposed from the series of studies on structural and functional imaging.[46-49] The deficits have been found to correlate with performance on the neuropsychological tests in children and adolescents.[50,51] However many of the studies have not considered the influence of normal development on the brain structure and function.

Predictive validity

Although different types of medium term outcome of ADHD have been reported;[52,53] the most consistent long term outcome is the continuation of psychopathology in adulthood.[54,55,56] Studies also report persistence of impairments in executive functions in adulthood.[57,58]

While short term benefits from both medical and psychosocial modalities of treatment have been reported;[59] no long term benefits have been consistently reported.[60] A meta-analysis of 62 methylphenidate trials showed some evidence of benefit at least for short duration.[42] Apart from the drugs, cognitive remedial techniques have been found to be effective in minimizing the deficits in attention, vigilance and hyperkinesis. The four long term trials (twelve months or longer) have not established the long term effectiveness or long term safety of stimulant medications.

Boundary issues

The boundary between ADHD or HD and other disorders is far from sacrosanct. The boundary concerns are especially evident between hyperactive impulsive subtype and CD and ODD, on the one hand; and inattentive subtype with learning disorders and sub average intelligence, on the other. However, children diagnosed to have ADHD according to DSM-IV and HD according to ICD-10 can be distinguished reliably from children with other disorders like conduct disorder and differ in important ways from normally developing children on laboratory measures of attention, social interaction and outcome.[43]

Discussion

Based on scant evidence on HD and drawing mainly from a large number of studies on ADHD of DSM-IV-TR it is possible to come to an arbitrary inference that ICD-10 HD has fair degree of internal validity but (as of yet) insufficient level of external validity.

The issue of dimensional and categorical model of classification remains unresolved at this stage although for ADHD the dimensional link between the normal and the morbid behavior is quite obvious. Whether dimensional model as such or a combination of quantitative and categorical system of classification should be accepted for the criteria of the disorder is more a matter of scientific wisdom than evidence at this stage.

The major disadvantage associated with the ICD-10 HD concept is that it defines a more severe disorder with a narrower boundary than that of DSM-IV-TR. The effect of age on the three symptom domains of HD is significant, for example, pre school children are hyperactive whereas inattention is prominent in grown up children and adolescents. The manifestation across gender is also quite distinct, hence girls maybe under-diagnosed.

The status of hyperkinetic conduct disorder is not clear at present. To an extent, clinical, neuro-psychological and family studies, support the hybrid hypothesis but there is hardly any evidence favoring its status as a subtype of HD. Its status as distinct category outside the domain of HD may be considered, however further research is required to support this.

Suggestions

- *The HD category of ICD-10 needs to be revised.*
- *The category should be changed to have disjunctive criteria for the three cardinal domains of symptoms.*
- *Co morbidity with other childhood disorders should be permitted.*
- *HD CD may be considered as a distinct category outside the domain of HD.*
- *There should be an emphasis on the inattentive subtype for all age groups of girls.*

Conduct disorder and oppositional defiant disorder

Conduct disorder (CD) refers to cluster of repeated antisocial acts in children and adolescents. The symptoms are usually considered undesirable at any period in a youngster's life because they tend to result in personal harm, deceitfulness or property damage. Oppositional defiant disorder (ODD) presents with cluster of behaviors like negativism, hostility, defiance and aggression that are considered developmentally inappropriate and interfere with psychosocial functioning. The symptoms can resemble normal problem behaviors, but are distinguished from normal behavioral problems if they occur at a rate and intensity that is atypical for the child's age group or persist through a later age than for most youngsters. Symptoms of ODD consist of overt or confrontive problem behaviors compared to most conduct disorder symptoms, such as theft and truancy, which are of a covert, concealing nature.[61] ODD includes primarily negative, hostile and defiant behaviours while CD includes behaviors that violate basic rights of others or major age appropriate societal norms or rules.[62] Among the mental disorders with onset in childhood, CD and ODD have the strongest association with psychosocial adversities.

Current nosology

DSM-IV-TR requires any three or more of the fifteen criteria for a minimum period of twelve months with at least one criterion present for the past six months.[2] The criteria sets include seven criteria of aggression to people or property, two criteria of destruction of property, three involving deceitfulness and theft and three about serious violation of rules with significant impairment in social, academic and occupational functioning with onset before eighteen years. DSM-IV criteria allow for sub-typing CD according to age of onset (before or after age 10) and severity (mild, moderate, or severe). The criteria make no reference to an exclusion related to a negative environment and allow for classification as conduct disorder of behaviors that are not caused by dysfunction. ODD is a separate category defined as a pattern of negativistic, hostile, and defiant behavior lasting at least 6 months with significant socio-occupational impairment, during which four or more of the criteria like ‘often loses temper, often argues with adults, often actively defies or refuses to comply with adults' requests or rules, often deliberately annoys people, often blames others for his or her mistakes or misbehavior, often touchy or easily annoyed by others, often angry and resentful, often spiteful or vindictive;’ are fulfilled.

ICD-10 requires any one of the categories of behaviours including excessive level of fighting or bullying, cruelty to animals or other people, severe destructiveness to property, fire setting, stealing, repeated lying, truancy from school and running away from home, unusually frequent and severe temper tantrums, defiant provocative behaviour and persistent severe disobedience; if marked and present for more than six months as sufficient for the diagnosis.[3] ICD-10 has greater consideration of ecological factors involved in the definition of the disorder as reflected in its inclusion of unsocialised CD, socialized CD and CD confined to family context. ICD-10 does not allow for co morbidities. In contrast to the distinct categories of DSM, ICD10 considers CD and ODD as a unitary concept, supporting the view that ODD, is an early onset disorder that can be a precursor of CD.[63] ICD-10 ODD is defined as persistent presence of markedly defiant, disobedient, provocative behaviour in absence of severe dissocial, aggressive acts that violate the law or the rights of others. It is considered as a less severe form of conduct disorder. Mixed category of conduct and emotion is an additional sub-category in ICD-10. This group of disorders is characterized by the combination of persistently aggressive, dissocial or defiant behaviour with overt and marked symptoms of depression, anxiety or other emotional

upsets. Both condugt and emotional symptoms need to be of a syndromal nature to qualify for the diagnosis. The ICD-10 text acknowledges that the data for this category are insufficient and there is a need for further research.

Both DSM-IV TR and ICD-10 primarily focus on the act rather than the internal mental state under which the act is performed. The text of DSM-IV acknowledges that the DSM-IV criteria for conduct disorder should be considered as met only in youths who have a hypothesized internal dysfunction in the form of failure of mechanisms involved in the capacity for empathy, guilt, moral conscience, and impulse control. However, this is not mentioned in the criteria and is thus not reflected in actual diagnoses.[64] Contrary to the textual exclusion and to the DSM-IV's definition of mental disorder, some authors suggest that internal dysfunction is not part of the intuitive concept of disorder and that antisocial conduct represents a mental disorder even when no internal dysfunction is present.[65,66]

The validity of sub typing in DSM-IV based on age of onset has been questioned. The subtypes included in earlier versions of DSM (e.g. socialized vs. undersocialised) and the contextual subtypes of ICD-10 were conceptualized based on relationship capacity. It is not clear if these subtypes were abandoned in DSM-IV-TR due to lack of evidence or difficulty in assessment.[67] The trait of being 'callous and unemotional' was excluded in the current version of DSM due to concerns about reliability of assessment. Recent studies have shown the trait may be assessed quite reliably and that it may improve prediction of outcome.

Review of evidence

Let us now try to answer the question raised in the introduction from the currently available research evidence.

Dimensional Vs. Categorical Approach

The behavioral components of ODD are likely to present in the normal children to varying degrees and may be a normal part of development for certain age groups and as a transient reaction or adaptation to adverse life situations. The differences between the affected and non- affected could be understood quantitatively in terms of the degree of severity.[68-70] The interaction between the genetic vulnerability and the developmental and environmental factors may be seen as contributing to the manifestation of the disorder. There is thus some evidence to make a case for dimensional system of classification for CD and ODD.[67,71]

Key components

The landmark work of Hewitt & Jenkins that proposed that aggression and socialization were the two cardinal organizing principles for understanding CD still remains relevant to present systems of classification.[72] Both DSM and ICD adopt this approach although in somewhat different ways. A study using latent class analysis identified five CD subtypes characterized by rule violations, deceit/theft, aggression, severe covert behaviors, and pervasive CD symptoms.[73] Factor analytic studies support aggression and delinquency (non aggressive behaviours) as distinct sub factors for CD. Frick et al carried out a meta-analysis of 64 factor analytic studies.[74] They applied multidimensional scaling technique and found four factors viz. overt non destructive behaviour (ODD), overt destructive symptoms of aggression, covert destructive behaviour like stealing, lying and covert non destructive categories like truancy, running away. The fact that empirical support exists for each of these dichotomous distinctions suggests that a more textured and multidimensional classification system is needed to

characterize subtypes comprehensively. The findings support the DSM approach of classifying the CD and ODD as separate categories.

Internal consistency

Field trials of CD defined according to DSM-IV[75] and ICD-10[76] found CD to among the most reliable of all diagnoses with kappa statistics of around 0.90. A study using dimensional approach showed that 6 of the 9 ODD symptoms and 8 of the 11 CD symptoms had significant internal validity.[77]

The link between ODD and CD has been further examined in several studies.[61,75,78,79] Factor analytic studies using CBCL symptoms suggest that ODD is partially distinct from CD especially regarding lying, fighting, bullying.[80] Factor analysis of parent and teacher responses to a structured psychiatric interview also revealed two dimensions of conduct problems similar to the distinction between ODD and CD. However, some symptoms often associated with CD (bullying and violation of major rules) consistently loaded uniquely on the factor composed of ODD symptoms.[78] These results partly support the DSM notion of the ODD and CD being separate disorders although the relationship appears to be complex and there certainly there is some overlap between the two conditions.

Though ODD is considered to be forerunner for CD, many children with ODD do not go on to develop CD and it is known that early intervention in cases with ODD may avert the development of CD. In terms of behavioral co variation, much of the literature suggests that most symptoms of CD and ODD are distinct with the mean age of onset for ODD symptoms earlier than that for CD symptoms. The research findings suggest ODD and CD are different disorders although they may be developmentally related.[61]

Presence of criterion symptoms in target populations

Several studies have used DSM-IV criteria to evaluate the prevalence of CD.[73,81,82,83] Based on these studies, the lifetime prevalence of CD has been estimated at between 6% and 16% for males and 2% and 9% for females in the United States of America. In United Kingdom, a prevalence of 5% has been reported using the ICD-10 criteria.[84] Consistently higher rates are reported in boys compared to girls; and in adolescents as compared to children.

Although prevalence rates have been reported to vary in different countries like Norway, New Zealand, Sweden, United Kingdom and United States of America;[85-88] the major models of etiology, symptom clustering, stability, and longitudinal course over the lifetime show a high level of convergence across international contexts. Cultural factors, such as level of acculturation, were reported as not associated with CD.[89]

Construct validity

Genetic studies provide some support for the sub typing of CD based on age of onset. The childhood onset is characterized by neurological and family deficits while the adolescent onset is related more to environmental and hormonal changes.[90] There is definite genetic liability to co occurrence of ODD, CD with ADHD and persisting symptoms of ODD and CD. The overall genetic correlation of CD and ODD appears to be dependent on presence of co morbidity and aggression.[91]

Most of the studies examining neuropsychological deficits have used the DSM criteria for CD. The primary deficits have been reported in verbal skills.[92-94] Frost et al using a community sample failed to uncover any deficit in executive function; except for a subgroup with co morbid ADHD.[92] Abnormal language processing in left temporal lobe and its relationship to aggression

has been thought as a factor responsible for high co morbidity of reading disorder. Low intelligence is often considered a precursor to CD. However, of the 27 studies that reported positive association between CD and low IQ 80% failed to control for ADHD.[95]

Very few studies have examined neuroimaging biomarkers in CD. The studies available primarily focus on aggression. Both frontal and temporal regions are likely to be associated with ODD and CD in addition to ADHD. Orbitofrontal damage is known to lead to impulsivity and aggression.[96] Hypoactivity of amygdala to emotional stimuli is reported in boys with callous unemotional traits in a study with a small sample that also lacked follow up data.[97]

Predictive validity

Research has shown that there is a particularly poor prognosis attached to early onset conduct disorder.[61,81,98,99] A number of theorists have suggested that a strong link is expected between disruptive and externalizing behaviours in pre-school years and externalizing behaviours in adolescents.[100,101] The hypothesized early-onset pathway begins with the emergence of ODD in early pre-school years and school years and progresses to both aggressive and non-aggressive symptoms (e.g. lying and stealing) of conduct disorders in middle childhood and then to the most serious symptoms by adolescence. Robins noted that it was rare to find an antisocial adult who had not exhibited conduct disorders as a child, even though no more than half of the children identified as having conduct disorders go on to become antisocial adults.[102-104] Children with conduct disorders who do not go on to develop antisocial personality disorder may develop a range of other psychiatric disturbances, including substance misuse, mania, schizophrenia, obsessive-compulsive disorder, major depressive disorder and panic disorder.[102,105]

The diagnosis of ODD is also reported to remain stable over time.[106] ODD showed the poorest recovery rate of all the behavioral psychiatric disorders.[107] Moreover, children with ODD do not necessarily develop conduct disorder when they grow older.[106,107] Two subtypes of ODD associated with ADHD have been identified: one that is prodromal to CD and another that is subsyndromal to CD but not likely to progress into CD in later years.

The treatment review of CD and ODD have often combined the two disorders for outcome issues. Overall treatment response apart from controlling aggression is poor for CD and treatment primarily focus on psychosocial interventions. According to the United States Department of Health and Human Services[108] and Burns et al[77] several psychosocial interventions can effectively reduce antisocial behavior in disruptive disorders. Two treatment types met criteria for well-established treatments and 10 for probably efficacious treatment. In particular, multi systemic therapy (MST) which includes parent training, classroom social skills, playground behavior programme, and systematic communication between teachers and parents, was reported as leading to significant short term reduction in aggression and was found to be cost effective. However, co morbid depression, substance use, and ADHD complicate interventions to a major degree.[109,110]

Boundary issues

There are consistent findings that disruptive behaviors inter correlate and share a factor structure separate from emotional disturbances and that they have a differential pattern of correlates as compared to emotional disorders.[111] However, the boundary of CD, to a considerable extent, is blurred with subtypes of ADHD, hyperkinetic conduct disorder, learning disorders and low IQ. Also, it is a clinical challenge to reliably distinguish conduct disorder from adolescent mania and/or substance use disorders.

Discussion

Based on some evidence on ICD-10 CD and drawing mainly from a large number of studies on CD and ODD of DSM-IV-TR it could be inferred that ICD-10 CD has fair degree of internal validity and some level of external validity.

The issue of dimensional and categorical model of classification remains relevant to these disorders. The heterogeneity of the disorder and its strong association with psychosocial adversities which lead to variable presentation not only within the group of CD cases but also within an individual in different settings; do not support the presence of distinct diagnostic categories and indicate the need for dimensional approaches. A quantitative (dimensional) description of ODD could be preferred to a strict categorical label and a combination of quantitative and categorical system of classification should be in order for CD. The operational aspects of such a system require to be worked out carefully.

The effect of age is significant so also the ecological, contextual factors thus more comprehensive subtypes or categories have to be formed to address this need. There is an also clear gender difference in manifestation and course of the disorder, which needs attention in the diagnostic system. Though there is evidence to suggest ODD as distinct from CD, the overlap of certain criteria in factor analysis studies is possibly indicating the need to further explore the practical utility of a separate diagnosis.

Suggestions

- *The category of CD of ICD-10 requires minor revision*
- *Oppositional defiant disorder should be given a distinct status*
- *The subtypes of CD should be based on both age of onset as well as context*
- *Caution should be exercised in making diagnosis in the context of negative societal reactions*

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